

## CLAIMS

We claim:

1. A method of using a computer network to facilitate distributed software development, using a pool of software modules maintained with a module manager, comprising the steps of:
  - a) establishing a connection via said network between a user computer and a module manager ("*connect*" step);
  - b) accepting at the module manager an indication from the user computer specifying a submission or a download ("*mode*" step);
  - c) if the indication specifies a submission, then (collectively "*submission*" step):
    - i) accepting at the module manager from the user computer access conditions ("*SAC*") related to a submit software module ("*SSM*") for submission to said pool ("*submit conditions*" step);
    - ii) accepting at the module manager from the user computer access information ("*SAI*") related to the SSM ("*submit access*" step);
    - iii) storing at the module manager the SAC and SAI as part of said pool ("*pool addition*" step);
  - d) If the indication indicates a download, then (collectively "*download*" step):
    - i) accepting at the module manager information from the user computer identifying a download software module ("*DSM*") to be downloaded from said pool ("*identify download*" step);
    - ii) accessing from the pool the access conditions ("*DAC*") associated with the DSM, and accepting at the module manager information from the user computer indicating that the DSM are accepted ("*download conditions*" step);



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- d) subsequent distribution to downloaders for research use is allowed on payment of a fee lower than distribution to downloaders for commercial use;
  - e) distribution from the module pool is allowed, but further distribution by downloaders from the module pool is prohibited;
  - f) distribution from the module pool is allowed, but further distribution by downloaders is
- 10 allowed only after payment of a fee.

9. The method of Claim 1, wherein the *submit access* step comprises accepting at the module manager the SSM from the user computer.
10. The method of Claim 1, wherein the *submit access* step comprises accepting at the module manager a computer network identifier identifying a computer from which the SSM can be accessed.
11. The method of Claim 1, wherein the *submission* step further comprises using electronic commerce contracting to transfer intellectual property rights corresponding to the SAC and the SSM.
12. The method of Claim 1, wherein said pool comprises a database of software module access information and corresponding access conditions, and wherein the *pool addition* step comprises adding corresponding entries to the database.
13. The method of Claim 1, wherein the *identify download* step comprises:
- a) communicating from the module manager to the user computer descriptions related to software modules in said pool;
  - b) accepting at the module manager information from the user computer specifying
- 5 selection of a download software module.
14. The method of Claim 1, wherein the *identify download* step comprises:
- a) accepting at the module manager information from the user computer specifying characteristics of a desired software module;
  - b) determining a set of software modules in said pool having said characteristics;

- 5      c) communicating from the module manager to the user computer descriptions related to software modules in said set;
- d) accepting at the module manager information from the user computer specifying selection of a download software module from said set.
15. The method of Claim 1, wherein the *download conditions* step comprises:
  - a) communicating the DAC from the module manager to the user computer;
  - b) accepting at the module manager a confirmation that the DAC are accepted.
16. The method of Claim 1, wherein the *download conditions* step comprises storing at the module manager a record of said acceptance and said communication of the DAI.
17. The method of Claim 1, wherein the *transmit download* step comprises communicating the DSM directly from the module manager to the user computer.
18. The method of Claim 1, wherein the *transmit download* step comprises communicating a computer identifier identifying a computer where the DSM can be accessed.
19. The method of Claim 1, wherein the *download* step further comprises using electronic commerce contracting to transfer intellectual property rights corresponding to the DAC and the DSM.
20. The method of Claim 1, wherein the SAC comprise fee information associated with access to the SSM.
21. The method of Claim 20, wherein the *download* step further comprises communicating the fee information associated with the DSM to the user computer, and accepting payment complying with the fee information at the module manager before communicating the DAI.
22. The method of Claim 20, further comprising, when a module is downloaded, storing in a fee-database information related to the download if indicated by the DAC, and wherein the *download* step further comprises determining a fee from the fee-database and the DAC.

23. The method of Claim 22, wherein the *download* step further comprises communicating said fee to the user computer, and accepting payment complying with the fee at the module manager before communicating the DAI.
24. The method of Claim 22, wherein the fee is determined from an indication of the demand for the DSM, wherein the indication of demand increases with increasing number of downloads of the module, and decreases with increasing numbers of downloads of other modules from the pool.
25. The method of Claim 24, wherein the effect of an individual download of the module on the indication of demand decreases with increasing time elapsed since said download, and wherein the effect of an individual download of another module decreases with increasing time elapsed since said download.
26. The method of Claim 1, wherein the *download* step allows download of a plurality of modules, and further comprising determining a fee associated with the download of the plurality of modules, where the fee is allocated among modules according to 
$$F_j = F_T W_T \frac{w_j v_j}{\sum_i w_i v_i}$$
, where  $F_T$  is the total fee,  $W_T$  is a proportion of the total fee to be allocated among modules,  $F_j$  is the fee allocated to module j,  $v_i$  is an indication of the value of module i, and  $w_i$  is a weighting applied to the value of module i, and wherein modules submitted early in the module pool have a larger  $w_i$  than they would have received had they been submitted later.
27. A method of using a computer to accept software modules into a module pool, comprising the steps of:
  - a) accepting access conditions ("SAC") related to a submit software module ("SSM") for submission to said pool ("*submit conditions*" step);
  - b) accepting access information ("SAI") related to the SSM ("*submit access*" step);
  - c) storing at the computer the SAC and SAI as part of said pool ("*pool addition*" step).

28. The method of Claim 27, further comprising maintaining a user database of users and associated access privileges, and wherein the *pool addition* step comprises storing the SAC and SAI only if the access privileges corresponding to said user indicate that said user is allowed to submit the SSM.
29. The method of Claim 27, wherein the *submit conditions* step comprises communicating a set of allowable access conditions, and accepting information specifying selections from said set.
30. The method of Claim 27, wherein said SAC include an indication of whether a software module is available for commercialization.
31. The method of Claim 27, wherein said SAC include at least one of:
  - a) subsequent distribution limited to object code;
  - b) subsequent distribution limited to downloaders having specified characteristics;
  - c) subsequent distribution only allowed on payment of a fee;
  - d) subsequent distribution to downloaders for research use is allowed on payment of a fee lower than distribution to downloaders for commercial use;
  - e) distribution from the module pool is allowed, but further distribution by downloaders from the module pool is prohibited;
  - f) distribution from the module pool is allowed, but further distribution by downloaders is allowed only after payment of a fee.
32. The method of Claim 27, wherein the *submit access* step comprises accepting the SSM from the user computer.
33. The method of Claim 27, wherein the *submit access* step comprises accepting an identifier indicating how the SSM can be accessed.
34. The method of Claim 27, wherein said pool comprises a database of software module access information and corresponding access conditions, and wherein the *pool addition* step comprises adding corresponding entries to the database.

35. A method of using a computer network to manage access to a pool of software modules, wherein the pool comprises entries having module access conditions and module access information, comprising the steps of:

- a) accepting information identifying a download software module ("DSM") to be downloaded from said pool ("*identify download*" step);
- b) accessing from the pool access conditions ("DAC") associated with the DSM, and accepting information indicating that the DSM are accepted ("*download conditions*" step);
- c) accessing from the pool the access information ("DAI") corresponding to the DSM, and communicating the DAI ("*transmit download*" step).

36. The method of Claim 35, further comprising maintaining a user database of users and associated access privileges, and wherein the *transmit download* step comprises communicating the DAI only if the access privileges corresponding to said user indicate that said user is allowed to download the DSM.

37. The method of Claim 35, wherein the *submit conditions* step comprises communicating a set of allowable access conditions, and accepting information specifying selections from said set.

38. The method of Claim 35, wherein the *download conditions* step further comprises accessing pool access conditions ("PAC"), and accepting an indication that the PAC are accepted.

39. The method of Claim 38, wherein the PAC comprises permission to modify the DSM and prohibition against distributing modifications anywhere except the module pool.

40. The method of Claim 35, wherein the *identify download* step comprises:

- a) communicating descriptions related to software modules in said pool;
- b) accepting information specifying selection of a download software module.

41. The method of Claim 35, wherein the *identify download* step comprises:

- a) accepting information specifying characteristics of a desired software module;

- b) determining a set of software modules in said pool having said characteristics;
- c) communicating descriptions related to software modules in said set;
- 5 d) accepting information specifying selection of a download software module from said set.

- 42. The method of Claim 35, wherein the *download conditions* step comprises:
  - a) communicating the DAC;
  - b) accepting a confirmation that the DAC are accepted.
- 43. The method of Claim 35, wherein the *download conditions* step comprises storing a record of said acceptance and said communication of the DAI.
- 44. The method of Claim 35, wherein the *transmit download* step comprises communicating the DSM directly.
- 45. The method of Claim 35, wherein the *transmit download* step comprises communicating a computer identifier identifying a computer where the DSM can be accessed.
- 46. The method of Claim 35, wherein the *download* step further comprises using electronic commerce contracting to transfer intellectual property rights corresponding to the DAC and the DSM.
- 47. The method of Claim 35, wherein the *download* step further comprises communicating fee information associated with the DSM, and accepting payment complying with the fee information before communicating the DAI.
- 48. The method of Claim 35, further comprising, when a module is downloaded, storing in a fee-database information related to the download if indicated by the DAC, and wherein the *download* step further comprises determining a fee from the fee-database and the DAC.
- 49. The method of Claim 47, wherein the *download* step further comprises communicating said fee, and accepting payment complying with the fee before communicating the DAI.
- 50. The method of Claim 47, wherein the fee is determined from an indication of the demand for the DSM, wherein the indication of demand increases with increasing number of



downloads of the module, and decreases with increasing numbers of downloads of other modules from the pool.

51. The method of Claim 50, wherein the effect of an individual download of the module on the indication of demand decreases with increasing time elapsed since said download, and wherein the effect of an individual download of another module decreases with increasing time elapsed since said download.

52. The method of Claim 35 wherein the *download* step allows download of a plurality of modules, and further comprising determining a fee associated with the download of the plurality of modules, where the fee is allocated among modules according to

$$F_j = F_T W_T \frac{w_j v_j}{\sum_i w_i v_i}, \text{ where } F_T \text{ is the total fee, } W_T \text{ is a proportion of the total fee to be}$$

allocated among modules,  $F_j$  is the fee allocated to module  $j$ ,  $v_i$  is an indication of the value of module  $i$ , and  $w_i$  is a weighting applied to the value of module  $i$ , and wherein modules submitted early in the module pool have a larger  $w_i$  than they would have received had they been submitted later.

53. A method of using a computer to facilitate distributed software development, comprising:

a) Accepting submitted software modules at a module manager, wherein accepting a submitted software module comprises:

i) Accepting access conditions specifying conditions for use of the submitted module;

ii) Accepting access information specifying how to access the submitted module;

iii) Storing the access conditions and access information as related entries in a database;

b) Allowing access by users to modules from the module manager, wherein allowing a user access to modules comprises:

i) Determining a desired software module from the database to be accessed;

- ii) Determining if the user's desired access complies with the access conditions associated with the desired software module, and, if so, then communicating the access information associated with the desired module to the user.

54. The method of Claim 53, wherein accepting access conditions for a submitted module comprises accepting an indication of whether the module is available for commercialization; and wherein allowing access to modules comprises determining if the user desires access to a set of modules for commercialization, and, if so, then
- 5 determining an apportionment of fees from commercialization according to

$$F_j = F_T W_T \frac{w_j v_j}{\sum_i w_i v_i}, \text{ where } F_T \text{ is the total fee, } W_T \text{ is a proportion of the total fee to be}$$

allocated among modules,  $F_j$  is the fee allocated to module  $j$ ,  $v_i$  is an indication of the value of module  $i$ , and  $w_i$  is a weighting applied to the value of module  $i$ , and wherein modules submitted early in the module pool have a larger  $w_i$  than they would have received had they been submitted later.

55. The method of Claim 54, wherein modules submitted early in the module pool have a larger  $w_i$  than they would have received had they been submitted later.
56. The method of Claim 53, wherein modules in the pool are characterized by membership in one of three classes, wherein the first class denotes modules not available for commercialization, the second class denotes modules available for commercialization, and the third class denotes modules available for commercialization and having a higher
- 5 quality than modules in the second class